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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,161	07/23/2003	Jeong-Hwan Song	5000-1-414	8002
33942	7590	06/29/2005	EXAMINER	
CHA & REITER, LLC 210 ROUTE 4 EAST STE 103 PARAMUS, NJ 07652			LEPISTO, RYAN A	
			ART UNIT	PAPER NUMBER
			2883	

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/625,161

Applicant(s)

SONG ET AL.

Examiner

Ryan Lepisto

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 May 2005.
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-19 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. **Claims 1-3, 7-10 and 14-16** are rejected under 35 U.S.C. 102(e) as being anticipated by **Lin (US 6,614,951 B2)**. Lin teaches an athermal arrayed-waveguide grating and the implied method of manufacturing of the grating (Figs. 1A, 2A, 3A, 3E and 3F) formed on a substrate (42) (with all the following components extending across the substrate) comprising an input waveguide (12) for inputting optical signals, a grating array (20) for separating the input signals into different light wavelengths, a first slab (14) having a first layer (part of 14) and second layer (26) with different refractive indices from each other (column 6 lines 64-67) for coupling the input waveguide (12) with the grating array (20), a second slab (18) for causing the different light wavelengths separated at the grating array (20) to be imaged on an egress surface and an output-waveguide array (16) for outputting each light wavelength imaged on the egress surface of the second slab (18) in a form of a separated channel. Lin further teaches that the first layer (part of 14) of the first slab (14) has a refractive index that is different from the

input waveguide (12) (column 7 line 65 through column 8 line 2) while the second layer (26) of the first slab (14) can be the same material, and therefore the same refractive index of the input waveguide (12) (column 8 lines 19-23).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. **Claims 6, 13 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin as applied to claims 1-3, 7-10 and 14-16 above, and further in view of what would have been obvious to one of ordinary skill in the art at the time of the invention.

Lin teaches the athermal arrayed-waveguide with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lin does not teach expressly the first layer of the first slab having a length of 21.07 μm in a direction in which the optical signal travels.

At the time the invention was made, it would be obvious to a person of ordinary skill in the art to have a length for the first layer of about 21.07 μm in that this is a dimension that is typical in known waveguide gratings. Applicant has not disclosed that an exact length of 21.07 μm provides an advantage, is used for a particular purpose, or solves a stated problem over say, 21.03 μm or any dimension well known in the art. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to

perform equally well with waveguide grating with the differing refractive index layers as taught by Lin because it will efficiently and cheaply create an arrayed waveguide grating with a periodic intensity distribution (column 2 lines 15-19).

Therefore, it would have been obvious to one of ordinary skill in this art to modify Lin to obtain the invention as specified in claims 6, 13 and 19.

The motivation would have been to create an efficient waveguide grating array that is not associated with optical losses that result from a shift in wavelengths (column 1 lines 38-40).

3. **Claims 4, 11 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin as applied to claims 1-3, 7-10 and 14-16 above, and further in view **Terada et al (US 4,812,012)** (Terada).

Lin teaches the waveguide grating array with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lin does not teach expressly a layer of material in the first slab waveguide having a refractive index of 1.415.

Terada teaches materials used in forming optical waveguides, where one is a polymer, polyfluoromethacrylate having a refractive index of 1.415 (column 6 lines 63-64).

Lin and Terada are analogous art because they are from the same field of endeavor, optical systems using polymer optical waveguide materials.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the polymer as taught by Terada for the first layer as taught by Lin since Lin teaches only that a polymer would be suitable for the light transmission media in the waveguide grating array (Lin, column 7 lines 36-38).

The motivation for doing so would have been to increase efficiency in the waveguide grating array by using material know to produce waveguides capable of performing at high speeds and accuracy (Terada, column 7 line 20 through column 8 line 4).

4. **Claims 5, 12 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin as applied to claims 1-3, 7-10 and 14-16 above, and further in view of **Yoneda (US 2003/0021567 A1)** (Yoneda).

Lin teaches the waveguide grating array with the limitations described above used to reject claims 1-3, 7-10 and 14-16.

Lin does not teach expressly a layer of material in the first slab waveguide having a refractive index of 1.46.

Yoneda teaches an AWG (Fig. 10) with a substrate (203) with waveguides formed of the substrate where the layer is a glass Si substrate with refractive index of 1.46 (paragraph 0086).

Lin and Yoneda are analogous art because they are from the same field of endeavor, waveguide grating arrays with glass a glass Si layer with waveguides.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the Si glass as taught by Yoneda for the second layer as taught by Lin since Lin teaches that the second layer may be Silicon or Silica (column 7 lines 3-5) and since both are well known glasses widely used in the art at the time of the invention.

The motivation for doing so would have been to increase efficiency in the AWG by using materials that will suppress the fluctuations of characteristics of optical waveguides elements due to temperature changes (Yoneda, abstract).

Response to Arguments

5. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

6. With regard to the applicant's affidavit filed under 37 CFR 1.131: It was shown that applicant does have basis for a filing date of 18 September 2002 for claims 1-3, 7-10 and 14-16. Claims 4-6, 11-13 and 17-19 do not have basis in the evidence shown and therefore to not get the earlier September filing date. The 35 USC 103(a) rejections using the Lazaro Villa reference have still be removed because the basic inventive concepts of claims 4-6, 11-13 and 17-19 is the structure cited in claims 1-3, 1-10 and 14-16 and therefore since the basic inventive concept of applicant's invention is awarded the earlier filing date, all rejections using the Lazaro Villa reference have been removed.

Conclusion

7. It is suggested that including both refractive indices stated in claims 4-5, 11-12 and 17-18 in with the structure of the earlier claims along with the length of the first layer stated in claims 6, 13 and 19 instead of each of these characteristic being individually claimed with the overall structure separately would sufficiently overcome the waveguide grating array prior art.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan Lepisto whose telephone number is (571) 272-1946. The examiner can normally be reached on M-F 7:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2883

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ryan Lepisto

Art Unit 2883

Date: 6/15/05



Frank Font

Supervisory Patent Examiner

Technology Center 2800